

DPD-5516-59
Copy 4 of 6

11 August 1959

MEMORANDUM FOR: Chief, PP/PMD

INFO : ES/O

SUBJECT : Substitution of Radar Reflectors for Lamps to
Designate Drop Zones

1. The use of mouth-inflated, aluminum-coated balloons as radar reflectors, in lieu of flashlights or beacons, to establish Drop Zone location and/or identification does not appear to be a practical solution to the stated problem. This conclusion was reached after investigating the questions 2a through 2e of the basic correspondence.

2. Briefly, the investigation of the proffered questions revealed the following:

a. Not all aircraft anticipated for use in the E & E missions will be radar equipped. The P2V7, C-119, and C-54 will be so equipped with either line scan or PPI-type radar. The Helio will not.

b. A rubber balloon sprayed with aluminum paint would be a poor target. If the paint were sprayed evenly during the inflated state, such cracking and chipping would probably occur during the deflation and storage of the balloon. A spherical target is the worst target for radar return (see c below).

c. The radar return from a spherical target is approximately 2 per cent assuming a perfect reflecting surface. If the balloon had such a perfect surface, which is not possible for the reason stated above, a representative size of the balloon for adequate radar return would be approximately 13 feet in diameter. This mouth-inflated balloon of some 3,000 plus cubic feet would require superhuman effort to inflate.

d. Since the return surface of the balloon is small, spacing could be a problem for a line scan radar. It should not be a problem for a PPI-type radar.

e. Due to the characteristics of the proposed balloon as stated above, and the high acuity of flashlights, it must be concluded that such an approach could not feasibly compare favorably with the visual intercept offered by flashlights.

3. If it is desirable, however, to pursue the use of radar for Drop Zone location, this alternate method is suggested. Use standard commercially purchased aluminum foil. The sheet aluminum will give a radar return of 60 per cent to 80 per cent as compared to less than twice the wave length of the radar signal. The maximum wave length of the radar sets to be used is about (2) two feet. Although (4) four feet of foil would be acceptable, prior testing shows (10) ten-foot lengths to give excellent return. The foil should be laid out in (3) three (10) ten-foot lengths, approximately (1) one foot apart, with the (10) ten-foot length along the intended flight path. It is possible to miss the target if the foil is placed perpendicular to the flight path if the aircraft is using line scan radar. No such problem exists when using PPI-type radar. The foil should be economical to purchase, easy to store, and much more simple to lay out than the inflation of a reflecting balloon.

4. Since the reflecting balloon proposal is primarily based on security of operation, one word of caution must not be overlooked. While the use of flashlights and/or radio beacons on the ground makes the ground agent subject to intercept, the approaching aircraft has heretofore been passive. Such would not be the case when using radar. The radar signal transmitted by the aircraft is subject to the same type of signal intercept as the ground radio beacon. Whether it is better for the ground or air operation to be the passive system must be determined by the using organization and the operational requirement.

SIGNED

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